SOLICITATION FOR FINANCIAL ASSISTANCE APPLICATIONS NO. DE-PS26-01NT40864

Advanced University Reciprocating Engine Program

CONTACT: Debra A. Duncan, Contract Specialist
TELEPHONE NO.: 412-386-5700
FAX NO.: 412-386-6137
E-MAIL: duncan@netl.doe.gov

ISSUING OFFICE:

U.S. DEPARTMENT OF ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY
P.O. Box 10940, MS 921-107
626 Cochrans Mill Road
Pittsburgh, PA 15236-0940

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DUE DATE: May 30, 2001

Information regarding this solicitation is available on the Department of Energy, National Energy Technology Laboratory web site at:
http://www.netl.doe.gov/business/solicit/index.html

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SECTION I - TECHNICAL REQUIREMENTS

1.1 SUMMARY

The Department of Energy (DOE), National Energy Technology Laboratory (NETL), is seeking applications on behalf of the Office of Power Technologies in DOE's Office of Energy Efficiency and Renewable Energy, for support of projects that are consistent with the goals of the Advanced Natural Gas Reciprocating Engine Program. This solicitation requests applications from only United States (US) universities and colleges for research activities that will make a significant impact in achieving the program goals stated below goals. In order to attain these goals, innovative and novel concepts need to be developed and current obstacles need to be overcome.

1.2 BACKGROUND INFORMATION

The DOE, supports the development of promising advanced power technologies that will improve energy efficiency, meet or exceed emissions requirements, enhance durability, and lower the costs of installation and operation.

The DOE is encouraging greater focus on a portfolio of advanced distributed energy systems. Current technology development efforts include industrial turbines, microturbines, reciprocating engines, and fuel cell technologies for use in industrial, commercial, institutional and residential applications. This solicitation focuses on the development of technologies that will enhance the performance of advanced natural gas reciprocating engines. This solicitation is restricted to colleges, universities, and other institutions of higher education. Previous solicitations have already focused on reciprocating engine research restricted to manufacturers and national laboratories.

US manufacturers and suppliers of reciprocating engines and the Federal government are partnering to develop the next generation of stationary natural gas internal combustion engines. These advanced systems will provide significant benefits to the nation and will position domestic engine manufacturers to better compete in what is becoming a more global market with significant opportunities in domestic power generation markets and emerging international markets. The Advanced Natural Gas Reciprocating Engine Program goals are:

1. **Energy Efficiency:** 50% electrical efficiency. Current spark-ignition natural gas engines range in efficiency from 34-38%. Application of high temperature materials, engine sensors and controls, improved combustion practices, and other advances may be able to attain efficiencies of 50%.

2. **Environmental Emissions:** NO_X target of 0.1 grams per horsepower-hour. Currently, the best domestic emission levels are 1.0 grams per horsepower-hour. In order to reduce NO_x emissions by an order of magnitude advances in combustion technology, sensors and controls, and emission reduction systems are critical to minimize environmental impacts.

3. **Cost:** Operating and maintenance 10% below today's costs for modern engines. Attaining this goal will result in $50 million savings to the nation between 2005 - 2010.

1.3 SOLICITATION OBJECTIVES

To achieve the project objectives, DOE/NETL through the OPT Advanced Natural Gas Reciprocating Engine Program, is requesting applications under the following two (2) topic areas:

Technical Topic No. 1 Ignition System Improvements

Background/Application:

Ignition systems with the best available technology today often do not meet customer increasing expectations for longer life and lower maintenance costs. Technologies now available are the result of high speed automotive engine applications. These technologies are not necessarily designed for the load and pressure effects that current medium speed engines require. The need for better ignition systems designs will increase significantly as compression ratios are driven higher to achieve higher engine efficiency, and as engines are operated leaner in order to achieved reduce levels of NO_x emissions.

Technical and Commercial Barriers:

Technical barriers include limited research on high energy, long life ignition systems accompanied by low volume production capability of the supplier base for these types of systems.

Technology Breakthrough(s) Needed:

Fundamental research is needed to understand ignition system demands for medium speed (1200-1800 revolutions per minute) natural gas engines, meeting customer expectations for life and maintenance costs. Also, research is needed at understanding ignition system dynamics in these engines, especially at the point of ignition during the beginning of the power cycle. As future designs will require increased cylinder pressures and rotational speeds, this research will be especially important as a model for continued developments in ignition systems.

Technical Topic No. 2 Parasitic Loss Reduction

Background/Application:

Currently, high-speed engines are believed to have lower frictional losses than medium speed (1200-1800 revolutions per minute) larger bore natural gas engines. Very little known work has been done to lower these losses in medium speed engines. Improvements in this area can be translated directly into lower fuel consumption without suffering a corresponding increase in NO_x emissions.

Technical and Commercial Barriers:

Due to the relatively low volumes of these engines, focus has mainly been placed on high-speed engines. Analytical models to do this work need to be refined, along with an organized teaming effort and sharing of the resultant work.

Technology Breakthrough(s) Needed:

Research is needed to address current medium speed large bore natural gas parasitic losses. Initial focus could be on the piston, piston ring, and cylinder liner interface, although all areas of the engine system could be investigated. Lubricity, materials, clearances, and temperatures are areas of concern as well. Finally, attention should be given to maintaining the traditional long lives that these engines are expected to provide. Any proposed research concerning lubrication should focus on currently available oils or oil additives.

SECTION II - CONDITIONS AND NOTICES

2.1 APPLICANT ELIGIBILITY

Pursuant to 10 CFR 600.6(b) eligibility for award is restricted to US universities and colleges. Only universities, colleges, or university-affiliated research institutes located in the US and its territories, including the Commonwealth of Puerto Rico and the Virgin Islands, may submit applications for consideration under this Program Solicitation. Submissions from university-affiliated research institutes must be made through the university and the university, not the university-affiliated research institute, will be the award recipient.

Universities or other institutions of higher education are eligible to apply, unless otherwise restricted by the Simpson-Craig Amendment.

The Simpson-Craig Amendment involves organizations which are described in section 501(c)(4) of the Internal Revenue Code of 1986 and engage in lobbying activities after December 31, 1995, shall not be eligible for the receipt of Federal Funds constituting an award, grant, or loan. Section 501(c)(4) of the Internal Revenue Code of 1986 covers:

> "Civic leagues or organizations not organized for profit but operated exclusively for the promotion of social welfare, or local associations of employees, the membership of which is limited to the employees of a designated person or persons in a particular municipality, and the net earnings of which re devoted exclusively to charitable, educational or recreational purposes."

Lobbying activities are defined broadly to include, among other things, contacts on behalf of an organization with specified employees of the Executive Branch and Congress with regard to Federal legislative, regulatory and program administrative matters.

2.2 NUMBER AND TYPE OF AWARDS

It is anticipated that there will be multiple awards resulting from this solicitation. However, the Government reserves the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this solicitation and will award that number of financial assistance instruments which serves the public purpose and is in the best interest of the Government. The Government intends to use Cooperative Agreements as the type of award instrument(s).

2.3 COST SHARING REQUIREMENTS

In accordance with 10 CFR 600.30, the DOE has determined that a minimum cost share for this project is 20%. Cost sharing must meet the requirements of 10 CFR 600.123 and 10 CFR 600.224. Allowable costs for cost sharing shall be in accordance with 10 CFR 600.127 and 10 CFR 600.222. The cost share requirement is based on a percentage of the total award value, and not as a percentage of the Government's share.

2.4 AVAILABILITY OF FUNDS

Support for this work will be provided by the DOE's Office of Energy Efficiency and Renewable Energy. Subject to the availability of funds, the Government expects to provide up to approximately $1,000,000 over the life of the projects to support work under this solicitation.

2.5 PROJECT PERIOD

The Government anticipates the project period for the subject awards to be twenty-four (24) to thirty-six (36) months. Awards will have project and budget periods that are specific to the project and funding.

2.6 REPORTING REQUIREMENTS

The Reporting Requirements identified in the model financial assistance agreement located at http://www.netl.doe.gov/business/faapiaf/MODEL.PDF are required to be submitted during performance of the award.

In addition to the standard reports identified in the model, the following reports will be incorporated in the resultant award:

Monthly Federal Assistance Program/Project Status Report; and,
Semi-Annual Technical Progress Report.

2.7 TIME, DATE AND PLACE APPLICATIONS ARE DUE

Applications shall be submitted in paper media and shall include one electronic version of the technical application as detailed in Clause 3.2 OVERALL ARRANGEMENT OF APPLICATION. Applications shall be submitted in sealed envelopes or packages addressed to the office and point of contact specified below:

APPLICATIONS MUST BE RECEIVED AT THE FOLLOWING MAILING ADDRESS NO LATER THAN MAY 30, 2001, 4:00 P.M. EST.

U. S. Department of Energy
National Energy Technology Laboratory
P. O. Box 10940
626 Cochrans Mill Road, Building 921, Room 107
Pittsburgh, PA 15236-0940

Point of Contact : Debra A. Duncan, Contract Specialist
Telephone Number: 412-386-5700
Fax Number: 412-386-6137
E-Mail Address: duncan@netl.doe.gov
Contracting Officer: Raymond R. Jarr

EXTERNAL MARKING OF APPLICATIONS

Applications shall be marked with the following information:

(1) Address of Proposer
(2) Solicitation Number
(3) Due Time and Date of Applications
(4) Point of Contact at Issuing Office

2.8 TELEGRAPHIC AND E-MAIL APPLICATIONS

Telegraphic and E-mail applications will NOT be considered. The term "Telegraphic" includes both mailgrams and facsimile submissions.

2.9 LATE APPLICATIONS, AMENDMENTS AND WITHDRAWALS OF APPLICATIONS

An application or amendment of an application shall be timely if it is received at the location on or before any of the deadline dates and times specified in this section.

Applications or amendments of applications may be withdrawn by written notice at any time before award. Written notice includes E-mails and facsimiles. An authorized representative may withdraw applications in person, if the representative's identity is made known and the representative signs a receipt for the application before award. Applications will not be returned unless they are timely withdrawn.

2.10 ANTICIPATED SELECTION AND AWARD DATES

It is anticipated that selections for award, and the actual awards, will be made this fiscal year, FY-2001.

2.11 CONTENT OF RESULTING AWARD

Any agreement awarded as a result of this solicitation will contain the applicable terms and conditions found in the Model Financial Assistance Agreement located at the NETL Website located at:

http://www.netl.doe.gov/business/faapiaf/MODEL.PDF

Blank areas appearing in the model agreement indicated by "[ ]" will be completed after negotiations.

2.12 APPLICATION PREPARATION COSTS

This solicitation does not obligate the Government to pay any costs incurred in the preparation and submission of applications, or in making necessary studies or designs for the preparation thereof or to acquire, or contract for any services.

2.13 COMMITMENT OF PUBLIC FUNDS

The Contracting Officer is the only individual who can legally commit the Government to the expenditure of public funds in connection with the proposed award. Any other commitment, either explicit or implied, is invalid.

2.14 FALSE STATEMENTS

Applications must set forth full, accurate, and complete information as required by this solicitation. The penalty for making false statements in applications is prescribed in 18 U.S.C. 1001.

2.15 QUESTIONS/AMENDMENTS TO SOLICITATION

All requests for explanation or interpretation of any part of the solicitation shall be submitted in writing and must be received by the Contract Specialist via E-mail or in writing not later than 4:00 p.m. local prevailing time on May 11, 2001. The Government reserves the right not to respond to questions submitted after this date, nor to respond to questions submitted by telephone or in person at any time.

The only method by which any term of this solicitation may be amended is by an express, formal amendment generated by the issuing office. No other communication, whether written or oral will amend or supersede the terms of this solicitation.

Amendments to the solicitation will be posted on NETL's website @ http://www.netl.doe.gov/business/solicit/. Applicants are encouraged to periodically check the NETL Homepage to ascertain the status of any amendments as hard copies will not be distributed.

2.16 CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER (CFDA)

81.086 -- Conservation Research and Development. The Applicant should put this CFDA number in Block 10 of the Standard Form 424, Application for Federal Assistance.

2.17 PARTICIPATION BY FEDERAL ORGANIZATIONS OR FEDERALLY AFFILIATED ORGANIZATIONS

Applications submitted by, or on behalf of: (1) another Federal agency; (2) a Federally Funded Research and Development Center (FFRDC), or (3) a DOE Management and Operating (M&O) contractor will not be eligible for an award under this solicitation. However, these organizations may be proposed as team members subject to the following guidelines.

(a) For DOE M&O contractors, the proposed use of such entity must be authorized in writing by the DOE Contracting Officer or authorized designee responsible for managing the M&O Contractor, and the applicant must provide the additional information identified in VOLUME I - APPLICATION DOCUMENTS found at the NETL Website located at www.netl.doe.gov/business/faapiaf/main.html. The DOE Contracting Officer responsible for managing the M&O Contractor must determine that performance by the M&O contractor: (1) is consistent with or complementary to DOE missions and the missions of the facility to which the work is to be assigned; (2) will not adversely impact execution of assigned programs of the facility; (3) will not place the facility in direct competition with the domestic private sector; and (4) will not create a detrimental future burden on DOE resources. DOE will make award to the applicant for the applicant's portion of the effort. For the M&O effort, DOE shall fund the work, in whole or in part, through a DOE field work proposal to the M&O contractor. If DOE funds a portion of the M&O effort, then the Recipient is responsible for funding the remaining portion of the effort through a Cooperative Research &Development Agreement (CRADA) or a service agreement utilizing their own funds.

(b) For FFRDC contractors (other than a DOE M&O contractor), the proposed use of such entity must be consistent with the FFRDC's authority under its contract with the cognizant Federal agency and such work must not place the FFRDC in direct competition with the private sector. DOE shall fund the FFRDC work through an interagency agreement with the cognizant Federal agency.

(c) For other Federal Agencies, the proposed effort must not place the agency in direct competition with the private sector. DOE shall fund the other agency work through an interagency agreement.

(d) An applicant's cost sharing requirement shall be based on the total cost of the project, including the applicant's and the Federal Agency, FFRDC and M&O's portions of the effort.

(e) The estimated total cost of the Federal Agency, FFRDC or M&O contractor(s) work, in the aggregate, shall not exceed ten (10) percent of the total estimated project cost.

2.18 DETERMINATION OF RESPONSIBILITY

DOE will evaluate the potential Recipient's responsibility before award. Responsibility determinations are focused on the Recipient's capability to manage and account for the funds, property and other assets provided and to perform satisfactorily under the terms of the award. If a potential Recipient is determined to not be in compliance or cannot or will not comply with generally applicable requirements (see 10 CFR Part 600, Appendix A), the contracting officer will find the Recipient not responsible and may either disapprove the application or use special restrictive conditions as a term of award.

2.19 EVALUATION PERSONNEL

Applications will be evaluated in accordance with the criteria set forth in Section IV of the solicitation. In conducting this evaluation, the Government may utilize assistance and advice from qualified personnel from other Federal Agencies, DOE Contractors, and industry. APPLICANTS NOT WISHING TO HAVE THEIR APPLICATION EVALUATED BY NONFEDERAL PERSONNEL SHALL INDICATE THEIR "NON-CONSENT" IN VOLUME I. Applicants are further advised that DOE may be unable to consider an application withholding such consent.

When using personnel from other Federal agencies, DOE contractors, or other consultants to DOE in the evaluation of applications, DOE will obtain assurances from all evaluators that DOE's commitments are met relating to the proprietary nature of any application information.

2.20 APPLICATION CLARIFICATION

DOE reserves the right to require applications to be clarified or supplemented to the extent considered necessary either through additional written submissions or oral presentations.

2.21 APPLICATION ACCEPTANCE PERIOD

The minimum application acceptance period shall be 180 calendar days after the deadline(s) for receipt of applications.

2.22 AWARD WITHOUT DISCUSSIONS

Notice is given that award may be made after few or no exchanges, discussions or negotiations. Therefore, all applicants are advised to submit their most favorable application to the Government. The Government reserves the right, without qualification, to reject any or all applications received in response to this solicitation and to select any application, in whole or in part, as a basis for negotiation and or award.

2.23 PRESUBMISSION REVIEW AND CLEARANCES

Presubmission review under Executive Order 12372, "Intergovernmental Review of Federal Programs" is not required.

2.24 LOANS NOT AVAILABLE

Loans are not available under the DOE Minority Economic Impact loan program, 10 CFR Part 800, to finance the cost of preparing a financial assistance application.

2.25 52.227-6 ROYALTY INFORMATION

(a) Cost or charges for royalties. When the response to this solicitation contains costs or charges for royalties totaling more than $250, the following information shall be included in the response relating to each separate item of royalty or license fee:

(1) Name and address of licensor.

(2) Date of license agreement.

(3) Patent numbers, patent application serial numbers, or other basis on which the royalty is payable.

(4) Brief description, including any part or model numbers of each contract item or component on which the royalty is payable.

(5) Percentage or dollar rate of royalty per unit.

(6) Unit price of contract item.

(7) Number of units.

(8) Total dollar amount of royalties.

(b) Copies of current licenses. In addition, if specifically requested by the Contracting Officer before execution of the contract, the offeror shall furnish a copy of the current license agreement and an identification of applicable claims of specific patents.

2.26 INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM

(a) PATENT RIGHTS

The government will have certain rights in all subject inventions. A subject invention is one which is conceived or first actually reduced to practice under a DOE award. This may include inventions that

have been patented prior to the award of the contract, if the invention is first actually reduced to practice under the contract. The statutes defining the government's rights are found at 35 U.S.C. §§ 200 to 212, **http://www4.law.cornell.edu/uscode/** and the regulations are found at 10 CFR 927.3 **http://www.access.gpo.gov/nara/cfr/index.html**. The following is a general discussion, which is not exhaustive and so should not be relied on as legal advice. Review the statutes and regulations referenced above, and the clauses referenced below for a more complete explanation.

If the contractor or subcontractor is a domestic small business firm or non-profit organization, the clause at 48 CFR 952.227-11 applies. Under this clause, the contractor will have the first option to elect to retain title to any subject invention. However, the government retains certain rights such as march-in rights, US preference, and government-use license.

If the contractor or subcontractor does not qualify as a domestic small business firm or non-profit organization, the clause at 48 CFR 952.227-13 applies. Under this clause, the government takes title to any subject invention and the contractor gets a revocable, nonexclusive, royalty free license. However, the contractor can petition the DOE for a waiver of patent rights. A minimum of 20% cost sharing is usually required for an advance patent waiver, and the DOE retains some rights in the invention such as march-in rights, US competitiveness, and government use license. The DOE waiver regulations are found at 10 CFR 784.

(b) RIGHTS TO TECHNICAL DATA

Pursuant to 48CFR 52.227-14 and 52.227-16, the Government has unlimited rights in technical data created under the agreement. Delivery or licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement or as may be negotiated as a condition of a patent waiver to insure continued development toward commercialization of an invention arising under a DOE agreement.

In this program, it is anticipated that DOE will be able to withhold certain technical data created under the program for up to five (5) years from the time it is created under The Energy Policy Act of 1992 (42 U.S.C §13541(d)). See the Act for a definition of the type of data that may be protected from public disclosure. The decision to include this provision in individual awards will be made on a case-by-case basis for each agreement considering the technology involved, etc. After the five (5) year time period expires, such data is subject to release if it is a Government record.

2.27 INDUSTRIAL COLLABORATION

To make the research more meaningful in its application to real-world problems, limited industrial collaboration is encouraged. The phrase "limited industrial collaboration" is defined as not-to-exceed 25% of the total estimated cost of the project. Please note that private industry involvement must be as a subcontract and not as a proposer. The purpose of industrial collaboration is to provide consultation and experimental data and/or equipment not available at the university or college.

2.28 NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.

SECTION III - APPLICATION PREPARATION INSTRUCTIONS

3.1 APPLICATION PREPARATION INSTRUCTIONS -- GENERAL

The application shall be prepared as set forth herein to provide a standard basis for evaluation and to insure that each application will be uniform as to format and sequence. Applications shall be prepared in accordance with this section and the instructions found at the NETL Website located at:

http://www.netl.doe.gov/business/faapiaf/main.html

To aid in evaluation, applications shall be clearly and concisely written as well as being neat, indexed (cross-indexed as appropriate) and logically assembled. All pages of each volume shall be appropriately numbered and identified with the name of the applicant, the date and the solicitation number to the extent practicable. Each volume is a stand alone document, therefore, some information provided may need to be included in all volumes.

Each application should clearly demonstrate the applicant's capability, knowledge, and experience in regard to the requirements described herein. Failure to respond or follow the instructions regarding the organization and content of the application may result in the application being deemed unacceptable.

During the review of a complete application, DOE may request the submission of additional information if the information is essential to evaluate the application.

3.2 OVERALL ARRANGEMENT OF APPLICATION

The overall application shall consist of three (3) physically separated volumes, individually entitled as stated below. Submit the required number of each application volume shown in the matrix below.

VOLUME	ORIGINAL	NO. OF COPIES	PAGE LIMITATION	ELECTRONIC VERSION*
Volume I -- Application Documents	1	3	None	No
Volume II -- Technical Application	1	5	30	Yes
Volume III -- Cost Application	1	3	None	No

*One electronic version of the technical application shall be submitted via diskette or CD-ROM in Adobe Acrobat Portable Document Format, WordPerfect, or Word.

ALL FORMS AND INSTRUCTIONS NEEDED FOR PREPARATION OF EACH VOLUME ARE FOUND ON THE NETL HOMEPAGE AT:

http://www.fetc.doe.gov/business/faapiaf/main.html

PLEASE NOTE THAT ALL FORMS WERE DEVELOPED USING WORDPERFECT 6.1 AND FORMATTED FOR PRINTING USING A HP LASERJET IIISi PRINTER. INSTRUCTIONS FOR COMPLETION OF THE FORMS ARE CONTAINED ON THE BACK OF EACH FORM. QUESTIONS ON COMPLETION OF THE FORMS SHOULD BE ADDRESSED TO THE CONTRACT SPECIALIST.

Cost detail to be provided within the Cost Application shall be required in the same level of detail for all proposed phases. Failure to provide the detailed cost information as described in the Cost Application instructions may result in an incomplete package.

3.3 UNNECESSARILY ELABORATE APPLICATIONS

Unnecessarily elaborate applications beyond those sufficient to present a complete and effective response to this solicitation are not desired. Elaborate art work and expensive visual presentations are neither necessary nor wanted.

3.4 VOLUME II -- TECHNICAL APPLICATION PREPARATION INSTRUCTIONS

The technical application shall not exceed thirty (30) pages. The text shall be typed, double-spaced, using twelve (12)-point font, and printed, unreduced on 8 1/2 by 11-inch paper. The application shall contain only single-sided pages. The format for the Technical Application can be found on the NETL Website at:

http://www.netl.doe.gov/business/faapiaf/main.html

In order to produce a comprehensive application for this solicitation, the "Technical Discussion" section of the technical application should address, at a minimum, the areas listed below. To help facilitate the review process and to insure addressing all the review criteria, the applicant shall use this format when preparing the technical application. This format relates to the technical evaluation criteria found in Section IV.

1. GENERAL

The technical application should provide a detailed description of the work that is being proposed, how the work is to be carried out, and how the results will benefit the goals of the Advanced Natural Gas Reciprocating Engine Program.

The Technical Application shall not exceed 30 pages. No material may be incorporated in any application by reference as a means to circumvent the page limitation. Pages in excess of the technical application page limitation identified will be excluded from evaluation.

The Statement of Project Objectives, resumes, additional pertinent publications, and letters of commitment are to be attachments to the Technical Application and will not be included in the page limitation.

2. FORMAT AND CONTENT

Volume II - Technical Application is to be composed of the following elements in the order designated below:

(A) Cover Sheet. A completed cover sheet as per the format specified on the NETL Website above, shall be used. The title of the proposed effort should be concise and descriptive of the work to be performed.

(B) Public Abstract. This section shall contain a public abstract as defined in the format contained on the NETL Website above. Unlike all other sections of the Technical Application, *the Abstract can be single-spaced*. The Applicant shall provide a point of contact for coordination, preparation, and distribution of press releases.

(C) Table of Contents. In order to produce a comprehensive application for this solicitation, the Applicant should address, at a minimum, the areas listed below. To help facilitate the review process and to insure addressing all the review criteria, the Applicant shall use the following Table of Contents.

TABLE OF CONTENTS

(D) Technical Discussion. This section shall contain the major portion of the Technical Application. It shall be presented in as much detail as practical and include, the following technical information:

1. Scientific and Technical Merit

This section shall describe the goals and objectives of the proposed work and demonstrate the applicant's understanding of the DOE's objectives set forth in the solicitation. The applicant must clearly indicate the extent to which the project, if successfully carried out, will make an important and/or original contribution to the natural gas reciprocating engine industry; and the importance of the economic and environmental benefits that can be realized from the research activities. This section shall provide background and rationale for conducting the proposed project and should address the following items as outlined in the table of contents:

- A clear narrative description of the project goals and objectives, and the scientific and technical basis that provides supporting rationale for the proposed work.
- A description of the relationship of the proposed work to the DOE's goals and objectives for this solicitation.

- A description of the current state of knowledge and/or technology that serve as background information for the proposed work.
- A description of how the proposed work will advance the current knowledge or technology for the solicitation objective being addressed.
- A description of the potential for the proposed work to contribute to a potential scientific or technical breakthrough in the solicitation objective being addressed.

2. Technical Approach

The applicant shall provide a clear description of the technical approach that will be implemented to accomplish the project objectives. This section shall include the following:

- A narrative description of the planned work. This description should be an expanded version of the Statement of Project Objectives and use the headings contained therein (e.g., Objectives, Scope of Work, Tasks to be Performed). It should be written in the active voice using consistent wording that divides the work into logical tasks and subtasks necessary to accomplish the project objectives. The Applicant shall provide a clear description of the work to be performed under each task and subtask. The description shall identify the product(s) and deliverables that will result from each task and its relation to the overall project. The description of the planned work shall contain necessary and sufficient information to estimate the cost of the work being proposed.
- Labor hours and justification. The Applicant shall provide a table listing the estimated labor hours and labor categories (e.g., project manager, principal investigator, engineering, technician, scientific, clerical) required for each task in the Statement of Project Objectives. The Applicant shall include a table showing labor hours and labor categories for any proposed subcontracting or consulting effort for each task. These categories should be easily cross-referenced with the key personnel identified in 3. below.
- The Applicant shall provide a project schedule and milestones, and describe the interrelationships of the project tasks. All significant milestones shall be defined in a milestone log and depicted on the schedule.
- The Applicant shall describe any proposed travel. The purpose of the trip, number of trips, the origin and destination, trip duration, and the number of personnel shall be included in the explanation.
- The Applicant shall describe potential obstacles to meeting project goals and mechanisms for mitigating potential problems.
- The Applicant shall describe how results of the proposed work will be made available to the DOE and to the public.

3. Technical, Management, and Facility Capabilities

The applicant shall provide the qualifications of all participating organizations and individuals, including subcontractors and consultants, to execute and manage the proposed effort. This should include:

- The credentials, capabilities, experience (technical and managerial) and availability of the key personnel to be assigned to the project. The roles of key personnel and the percentage of time being devoted to the project should be clearly identified. Resumes of key project personnel shall be included in Appendix B.
- A description of the project organization and structure, responsibilities and lines of authority, both technical and administrative, of the participating organizations and key personnel as they relate to the tasks and subtasks in the Statement of Project Objectives.
- A brief description of the credentials, capabilities, and experience of the universities/colleges involved in the work effort..
- A description of the type, quality, availability and appropriateness of facilities, equipment, and materials to be utilized in carrying out the proposed work.

3.5 INSTRUCTIONS FOR PREPARING THE STATEMENT OF PROJECT OBJECTIVES

All applications must contain a single, detailed Statement of Project Objectives that addresses how the project objectives will be met. The Statement of Project Objectives must contain a clear, concise description of all activities to be completed during project performance and follow the structure discussed below.

Applicants shall prepare the Statement of Project Objectives in the following format:

TITLE OF WORK TO BE PERFORMED

(Insert title of work to be performed. Be concise and descriptive.)

A. OBJECTIVES

Include one paragraph on the overall objective(s) of the work. Also, include objective(s) for each phase of the work.

B. SCOPE OF WORK

This section should not exceed one-half page and should summarize the effort and approach to achieve the objective(s) of the work for each Phase.

C. TASKS TO BE PERFORMED

Tasks, concisely written, should be provided in a logical sequence and should be divided into the phases of the project. This section provides a brief summary of the planned approach to this project.

PHASE I

Task 1.0 - (Title)

(Description)

Subtask 1.1 (Optional)

(Description)

Task 2.0 - (Title)

D. DELIVERABLES

The periodic, topical, and final reports shall be submitted in accordance with the attached “Federal Assistance Reporting Checklist” and the instructions accompanying the checklist.

The Recipient shall provide a list of deliverables other than those identified on the “Federal Assistance Reporting Checklist” that will be delivered. These reports shall also be identified within the text of the Statement of Project Objectives.

1. Task 1.1 - (Report Description)
2. Task 2.2 - (Report Description)

E. BRIEFINGS/TECHNICAL PRESENTATIONS (If applicable)

1. The Recipient shall prepare annual detailed briefings for presentation to the Contracting Officer's Representative (COR) at the COR's facility located in Pittsburgh, PA or Morgantown, WV. Briefings shall be given by the Recipient to explain the plans, progress, and results of the technical effort.

2. The Recipient shall prepare and present at the COR's NETL facility located in Pittsburgh, PA or Morgantown, WV, an overview of the entire project at a kickoff meeting at a time to be arranged by the COR. The overview shall include a discussion of the technical approach, project management, and a detailed breakdown of the project budget. (For costing purposes, Pittsburgh, PA should be used as the location.)

3. The Recipient shall provide and present a technical paper(s) at the DOE Annual Contractor's Review Meeting to be held at the DOE designated facility located in the Washington, DC area.

SECTION IV - EVALUATION AND SELECTION

4.1 INTRODUCTION

This section contains the evaluation approach as well as the individual criteria to be used in the evaluation of applications.

4.2 GENERAL

It is the policy of DOE that any financial assistance be awarded through a merit-based selection process which means a thorough, consistent and independent examination of applications based on pre-established criteria by persons knowledgeable in the field of the proposed project.

4.3 PRELIMINARY REVIEW

Prior to a comprehensive evaluation, applications will undergo an initial review to determine whether the information required by the solicitation has been submitted and is properly completed. Applications will be reviewed for relevance to the goals of the Advanced Natural Gas Reciprocating Engine program and for responsiveness to the requirements of the solicitation. Solicitations that require cost-sharing will be reviewed to insure that this requirement has been met. Volume I of the application will be reviewed to assess the Applicant's eligibility under the lobbying and Simpson-Craig Amendment requirements. Failure to successfully meet any one of these preliminary review criteria may result in the elimination of the application and no further consideration in the Comprehensive Evaluation. In the event that an application is eliminated, a notice will be sent to the Applicant stating the reason(s) that the application will not be considered for financial assistance under this solicitation.

4.4 COMPREHENSIVE EVALUATION

Applications passing the preliminary evaluation shall be subject to a comprehensive evaluation in accordance with the technical evaluation criteria listed in this section.

The technical evaluation is conducted to determine the merits of the technical application with regard to the potential success of the project as well as future commercial applications. Comprehensive evaluation results in a numerical score for each application against each of the technical evaluation criteria.

The Environmental, Health, Safety, and Security (EHSS) Evaluation, which is not point scored, is conducted to determine the completeness of the Environmental Questionnaire, and to assess the applicant's awareness of EHSS requirements for mitigating project related EHSS risks and impacts.

The cost evaluation, which is not point scored, is conducted to determine the completeness of the cost estimate, appropriateness and reasonableness of the cost, and to assess the applicant's understanding of the Statement of Project Objectives.

4.5 TECHNICAL EVALUATION CRITERIA

Technical applications submitted in response to this solicitation will be evaluated and scored in accordance with the criteria listed below:

A. Criterion 1 -- Scientific and Technical Merit (45%)

The overall quality, soundness, and reasonableness of the Applicant's proposed work including: (1) purpose of the proposed work project and its goals and objectives; (2) relationship of the proposed work to the DOE's goals and objectives for this solicitation; (3) current state of knowledge and technology for the proposed work; (4) how the proposed work will advance the current knowledge or technology for the solicitation objective being addressed; and (5) potential for the proposed work to contribute to a scientific or technical breakthrough in the solicitation objective being addressed.

B. Criterion 2 -- Technical Approach (35%)

The overall quality, soundness, and reasonableness of the Applicant's technical approach to fulfill the requirements of the proposed work, based on the following: (1) the approach and work plan which divides the project into the logical phases, tasks, and subtasks necessary to accomplish the project objective(s); (2) labor hours and justification required for each task, including a table showing labor hours and labor categories, including those for any proposed subcontracting or consulting effort for each task; (3) the project schedule with milestones; (4) proposed travel including the purpose, number of trips, origin and destination, trip duration, and number of personnel; (5) the potential for any problems or significant delays that could affect the project products or schedule and mitigation strategies; (6) the technology transfer plan which demonstrates how results of the proposed work will be made available to the DOE and to the public.

C. Criterion 3 -- Technical, Management, and Facility Capabilities (20%)

The qualifications and relative experience of proposed personnel to be assigned to the project, as well as the qualifications of all participating organizations and individuals, including subcontractors and consultants, to execute and manage the proposed effort will be considered, including the following: (1) the credentials, capabilities, experience (technical and managerial) and availability of the key personnel to be assigned to the project; (2) the project organization and structure, responsibilities and lines of authority, both technical and administrative, of the participating organizations and key personnel; (3) the credentials, capabilities, and experience of the universities/colleges involved in the work effort; and (4) the type, quality, availability and appropriateness of facilities, equipment, and materials to be utilized in carrying out the proposed work.

4.6 COST EVALUATION CRITERIA

The costs proposed will be evaluated in response to this solicitation in order to:

(a) determine the level of verifiable cost sharing;

(b) ensure that all work elements included in the Statement of Project Objectives have associated costs, and that those cost appear appropriate and reasonable for the effort proposed; and

(c) assess the applicant's understanding of the Statement of Project Objectives.

4.7 RELATIVE ORDER OF IMPORTANCE OF EVALUATION CRITERIA

The evaluation of the technical application will be conducted using preestablished weights to determine the relative merits of the application in accordance with the technical evaluation criteria. The technical evaluation (Volume II - Technical Application) represents 100% of the total evaluation scoring. Although Volume I and Volume III will not be point scored they will be considered in the selection decision and must be addressed.

The following weighting factors will be applied to each technical evaluation criteria to obtain a final evaluation rating for each application.

Criterion 1.	Scientific and Technical Merit	45%
Criterion 2.	Technical Approach	35%
Criterion 3.	Technical, Management and Facility Capabilities	20%
Total Technical Evaluation Factors		100%

4.8 APPLICATION OF PROGRAM POLICY FACTORS

These factors, while not indicators of the Application's merit, e.g., technical excellence, cost, proposer's ability, etc., may be essential to the process of selecting the application(s) that, individually or collectively, will best

achieve the program objectives. Such factors are often beyond the control of the Applicant. Applicants should recognize that some very good applications may not receive an award because they do not fit within a mix of projects which maximizes the probability of achieving the DOE's overall research and development objectives. Therefore, the following Program Policy Factors may be used by the Source Selection Authority (SSA) to assist in determining which of the ranked application(s) shall receive DOE funding support.

1. It may be desirable to select for award a group of projects that support a balanced portfolio of projects that represent a diversity of technologies and proposing entities, if such a selection will effectively and efficiently utilize Federal funds.

2. It may be desirable to support complementary and/or duplicative efforts or projects, which, when taken together, will benefit the broad cross-section of the natural gas reciprocating engine industry.

3 It may be desirable, because of the nature of the energy source, the type of projects envisioned, or limitations of past efforts, to select for award a group of projects with a broad or specific geographic distribution.

The above factors will be independently considered by the SSA in determining the optimum mix of applications that will be selected for support. These policy factors will provide the SSA with the capability of developing, from the competitive solicitation, a broad involvement of organizations and organizational ideas, which both enhance the overall technology research effort and upgrade the program content to meet the goals of the DOE.

4.9 BASIS FOR SELECTION AND AWARD

The DOE anticipates the award of one or more financial assistance instruments to those applicants whose applications are determined to be in the best interest of the Department in achieving the program objectives set forth in this solicitation. Selection of an application by the Department will be achieved through a process of evaluating and comparing the relative merits of the applicant’s complete applications, in accordance with all of the evaluation factors set forth in this section.

This process reflects the Department’s desire to accept an application based on its potential in best achieving program objectives, rather than solely on evaluated technical merit or cost. Accordingly, the DOE may select for an award all, none, or any number or part, of an application, based on its decision as to which meritorious applications best achieve the program objectives set forth in this solicitation.

It is important for applicants to note that selection for negotiations will be made entirely on the basis of applications submitted. Applications should, therefore, address specifically the factors mentioned in the evaluation criteria, and not depend upon reviewers' background knowledge.